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DFO Atlantic Fisheries
Research Document 96/33

MPO Pêches de l'Atlantique
Document de recherche 96/33

A Review of the 4VWX3NOPs Halibut Stock

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[1]La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

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104-07130/

Abstract

A precautionary TAC of 850 t was in place for the 1995 halibut fishery. The domestic landings were below the TAC at 708 t. Allocations in 1995, under the 850 t TAC, were restrictive only to the (4VWX3NOPs) 65'-100' fixed gear fleet and the <65' mobile gear fleet bycatch fishery on the Scotian Shelf. However, the 4VWX <65' longline fleet stayed within their allocation through the use of monthly quotas, and some quota groups permitting only a bycatch or catch and release fishery in their 1995 Management Plan. The European Union (EU) continues to report variable halibut catches outside the 200 mile limit that are not accounted for under the current management plan. Small longliners account for over 70% of the landings. Commercial catch rates for this fleet have declined gradually (4VWX) or showed stability (3NOPs) in recent years, but declined significantly in 1995. Management measures implemented in order to deal with the reduced TAC and fleet allocations may have negatively impacted the commercial catch rates. Total effort for the whole area increased in 1995 and in 4VWX increased since 1993. Although a large scale redirection of effort to halibut as a result of closures in other fisheries is not evident, the increased effort was noted, especially in 4VWX. Research surveys indicated an increase in abundance between 1983 and 1991 and have declined since. The surveys generally catch smaller halibut than the commercial fishery, and suggest a decline in recruiting yearclasses. The FRCC recommended a TAC of 850 t for the 1996 fishery. However, all biological indicators indicate a resource in a severely depressed state and maintenance of the existing level of effort on this stock is likely to further the decline in this resource. There is a need to define effective management measures for the 1997 fishery to reduce the effort on this stock.

Résumé

Un TAC prudent de 850 t a été fixé pour la pêche du flétan de 1995. Les débarquements nationaux étaient inférieurs au TAC, à 708 t. Les allocations en 1995, en vertu du TAC de 850 t, comportaient des restrictions seulement en ce qui concerne les prises accessoires des bateaux de pêche aux engins fixes de 65 à 100 pieds (4VWX3NOPs) et des bateaux de moins de 65 pieds sur le plateau néo-écossais. Cependant, les palangriers de moins de 65 pieds de 4VWX ont respecté leur allocation en utilisant des quotas mensuels, certains quotas ne permettant que les prises accessoires ou la capture et la remise à l'eau en vertu de leur plan de gestion de 1995. L'Union européenne (UE) continue de déclarer des prises de flétan variables, en dehors de la limite des 200 milles, qui ne sont pas comptabilisées en vertu du plan de gestion actuel. Les petits palangriers ont rapporté plus de 70 % des débarquements. Les taux de prises commerciales de cette flottille ont diminué graduellement (4VWX) ou se sont stabilisés (3NOPs) depuis quelques années, mais ont subi une baisse substantielle en 1995. Les mesures de gestion adoptées à cause de la réduction du TAC et des allocations aux flottilles pourraient avoir eu des effets négatifs sur les taux de prises commerciales. L'effort total pour l'ensemble de la région a augmenté en 1995, de même que dans les divisions 4VWX depuis 1993. Bien qu'on ait pas observé de réorientation à grande échelle de l'effort de pêche vers le flétan par suite de la fermeture d'autres pêches, on a toutefois noté une certaines intensification des activités, surtout dans 4VWX. Les relevés de recherche ont révélé un accroissement de l'abondance entre 1983 et 1991, suivie d'une diminution par la suite. Les flétans capturés au cours des relevés sont habituellement plus petits que ceux de la pêche commerciale, ce qui indiquerait une diminution des classes recrutées. Le CCRH a recommandé un TAC de 850 t pour la pêche de 1996. Cependant, tous les indicateurs biologiques montrent que les ressources sont en très mauvais état et que le maintien de l'effort de pêche actuel sur ce stock ne pourra qu'intensifier l'affaiblissement de la ressource. Il faut adopter des mesures de gestion efficaces pour la pêche de 1997 afin de réduire l'effort de pêche sur ce stock.

Introduction

Atlantic halibut (4VWX3NOPs) is the most highly valued groundfish species occurring in the Northwest Atlantic. Prior to 1988 the Atlantic halibut fishery was unregulated. This was mainly due to a shortage of stock assessment data, and a lack of interest in halibut management prior to that time. A halibut working group was formed at that time to look at management alternatives for the 1988 fishery. With increased interest in the fishery, and concerns expressed by industry, a precautionary TAC of 3,200 t was set in 1988 based largely on recent catch levels. A declining longline catch rate was noted as well. The TAC remained at this level until 1994 at which time, after reviewing the 1993 assessment information, the FRCC recommended that, as a precautionary measure, the 1994 TAC should be set at 1,500 t, rather than the previous 3,200 t. Due to concerns that the stock was still declining and that redirection of effort would result in higher mortality on halibut, the 1995 TAC was reduced to 850 t and the FRCC recommendation for 1996 was to maintain the status quo.

The industry working group also recommended, and industry then requested, a minimum size limit of 81 cm for Atlantic halibut (Anon. 1987). This size limit was generally not enforced prior to 1990. Difficulties were encountered in determining the actual size of the landed fish, as many were landed without head, and/or tail. Mandatory landing of all groundfish was introduced for the 1993 fishery, thus eliminating the minimum size regulation for halibut. Fixed gear interests then requested that halibut be exempted from the mandatory landing regulation. Regulation 93.3 was subsequently amended to permit the discarding of dogfish, skate, lumpfish and undersized halibut, i.e., <81 cm. Licence conditions have since been used to enforce the regulation for the <65' fleets, making it mandatory to throw back small halibut whether dead or alive, and current conditions also require halibut to be landed complete with head and tail. However, for halibut landed with a head off length >81 cm this condition is not enforced. For the <65' mobile gear fleet, once their halibut bycatch quota is taken, licence conditions require them to discard all Atlantic halibut regardless of size. Until 1996 licence conditions did not require the offshore fleet to release undersized halibut and their 1996 Management Plan included the mandatory release of <81 cm halibut.

Commercial Landings

Halibut landings declined from 3,274 t in 1961 to 1,059 t in 1976 (Tables 1 and 2, Figs. 1a, b) but, between 1977 and 1985 landings increased steadily to a high of 4,031 t. Since 1985 total landings declined to 1,373 t in 1992, rose to 1,618 t in 1993 due to high landings by European Union (EU) countries, then dropped again in 1994 to 1,106 t as foreign landings again declined. For 1995 landings again dropped to 855 t, coincident with the reduction in TAC. Foreign landings, especially in 3NO, increased considerably after 1982 (Fig. 2a). These foreign landings, reported by EA vessels, have a high interannual variability. Foreign landings are not accounted for under the current management plans.

Canadian domestic landings reached a peak in 1985 (3,531 t), declined to 1,023 t in 1994 and to 708 t in 1995 (Fig. 2c). Scotian Shelf landings for 1995 declined by about 40% (Fig. 2b); however, the Southern Grand Banks fishery remained similar to 1994. The 1988-1993 precautionary TAC of 3,200 t did not limit the fishery for any gear sector (Fig. 2c) with the exception of the less than 65' mobile gear fleet bycatch fishery. The 1994 precautionary TAC of 1,500t, was not fully caught as some sectors did not fully utilize their allocations, but no sector fished unrestrained. Mobile gear

fleets operated on a bycatch-only system and the <65' longline fleet took slightly over their allocation and could have taken more. The 1995 TAC of 850t was thought to be very restrictive by the <65' fixed gear fleet. They managed to stay within their allocation through the use of monthly quotas, and some quota groups permitting only a by-catch or catch and release fishery under their 1995 management plan.

Although in the past 4X accounted for the largest proportion of the landings, in recent years (1989-1992) landings in 4X and 4W have been similar and together accounted for approximately 50% of Canadian landings for all areas. In 1993 landings in 4W dropped significantly from 380 t to 284 t, while 4X landings increased from 352 t to 391 t. In 1994 landings by area on the Scotian Shelf remained stable, with 4V landings increasing slightly, and 4W and 4X declining somewhat. The initial drop in 4W was likely the result of reduced effort due to the cod moratorium first imposed in 1993. Landings by area in 1995 indicated a decline in 4X likely related to the stop start aspect of the 1995, <65' fixed gear fishery, and increased activity in 3Ps due to the taking of previously underutilized allocations by the 65-100' fixed gear fleet. Table 3 gives halibut landings by quarter and indicates that the Canadian fishery is prosecuted mainly in the spring and summer in 4VWX (Table 3a), and primarily in the spring in 3NOPs (Table 3b). Summer landings in 1995 were somewhat lower likely due to the quota restrictions under the <65' fixed gear management plan. Foreign landings (Table 3c, 3d) are incidental on the Scotian Shelf and taken as bycatch in the silver hake fishery. The EU prosecutes a spring and summer fishery in 3NO outside the 200 mile limit. Although not included in the stock area, 5Zc landings for 1995 were 8 t. According to the Management Plan, landings from 5Zc are counted against the quota even though 5Zc is not considered part of the official stock area.

Small vessels tonnage class (TC) 1-3 i.e. <150 GRT using longline gear are the dominant fleet in the Scotian Shelf fishery accounting for over 70% of the landings (Table 4, Fig. 3 a). In 1995 over 80% of the Scotian Shelf landings can be attributed to this fleet. Landings by the <65' mobile gear fleets in 4X were restricted by their small allocation as they are not permitted to direct for halibut. Longliners also account for most of the Canadian landings in 3NOPs (Table 5, Fig. 3b). Landings in that area for both small and large longliners dropped significantly in 1994 and remained constant in 1995. The drop may be related to the closed directed cod fishery in 3NO.

Management

With the introduction of a precautionary TAC in 1988, the halibut fishery has been regulated by quotas on five gear sectors: 1) fixed gear <65'; 2) mobile gear <65'; 3) fixed gear 65-100'; 4) mobile gear 65-100'; and, 5) all gear >100'. Longliners are the only gear type which direct for halibut, with the mobile fleets restricted to bycatch fisheries. Allocations to these various fleet sectors were generally based on a five year catch history.

The 1995 landings were 142t less than the TAC. Fixed gear <65' fishing on the Scotian Shelf caught 99% of their allocation, while on the Southern Grand Banks only 44% of the allocation was taken. The mobile gear fishery by >65' boats, took 65% of their 141 t allocation. The <65' mobile gear and the 65-100' fixed gear fleets were the only gear sectors to exceed their allocation. Their halibut fisheries were closed on April 28, and August 18, 1995, respectively. In previous years the 65-100' fixed gear fleet did not catch their allocation and in 1994 took only 39%. Quota allocations,

associated catch for 1995, and pertinent licence conditions are presented in Table 6. The 1996 TAC of 850 t under present allocations is very restrictive to the <65' fixed gear fleet and as in 1995 will result in a primarily bycatch fishery for halibut in 1996 by many of the fleet sectors.

Since 1984, special permits were given to inshore fixed gear vessels from Scotia-Fundy to allow the access to the halibut fishery in 3NO. A special allocation of cod, permits sufficient bycatch to pursue the halibut and hake fishery. Due to weather conditions Scotia-Fundy vessels got a late start in this fishery, and often the cod bycatch was limited depending on the amount taken by Newfoundland vessels earlier in the season. To remedy this situation, for the 1993 fishery, each sector's fleet had its own cod quota. Since 1994, no directed cod fishery was allowed in 3NO. The fishery was limited to a 5% or 1,250 kg cod bycatch, observer presence, and use of a #14 or greater hook was mandatory.

Industry Consultations

In discussions with industry in 1995 and early 1996, fishermen emphasized the large numbers of small halibut that were being released, and the potential high survival of these fish (Neilson *et al.* 1989). They suggested that the release program may have had a negative impact on the commercial catch rates, especially since 1992, as enforcement improved. Fishers felt that although halibut stocks were low, the 850 t TAC recommended by the FRCC for 1996 remains too low. They indicated that the large numbers of small halibut being released were a sign of increased abundance and should be taken into consideration when discussing declining catches. An Industry working group would like the FRCC to consider a proposal to release large halibut greater than 57 kg, as well as the less than 81 cm fish, in order to protect and enhance the spawning stock, assuming that this would allow the more fecund animals to spawn. It was also noted by Industry that the circle hook was far more efficient at catching larger halibut and that the introduction of this hook in the mid 1980's was responsible for the lack of large halibut in recent years.

The cooperative Industry/Science tagging program started in 1995 has continued in 1996. Groups of halibut fishermen from three areas (i.e., Shelburne, ENS and Cape Breton) have been supplied with tagging equipment, and tagged undersized halibut during the 1995 fishery. To date over 600 halibut have been tagged by the participating groups, however few recoveries have been recorded to date. Discussions with industry were held to try to improve halibut sampling and in 1996 a program will be initiated using a halibut otolith /length relationship to predict fish length. As well discussions are underway to review the conversion factors currently being used for Atlantic halibut.

Commercial Catch Rates

A commercial catch per unit of effort (CPUE) series, based on halibut directed longline catch and fishing effort (in thousands of hooks), was estimated from zonal interchange format (ZIF) data for 1985 to 1995 for 4VWX, 4VWX&3NOPs and 3NOPs alone. For the years prior to 1985, data for 4VWX was provided from the 1987 assessment by Neilson *et al.* (1987), using regional data (Table 7, Fig. 4a). Catch data from all tonnage classes of longliners for the whole year was used in developing the series. It should be noted that prior to 1988, longline effort was collected as lines fished and since has been reported as thousands of hooks.

Commercial catch rates which declined gradually in the 4VWX area for the directed longline fishery

in recent years, declined significantly in 1995. The reduction in TAC to 850t and corresponding reduced allocations led to a management plan involving monthly quotas fished as bycatch by the <45' fixed gear fleet, and a catch and release program by the 45-65' fleet after June 1995. These management measures may have impacted the catch rates for 1995. The proportion of directed catch with effort, in the January to June period, although usually about 60-70% of the catch, rose to 88% in 1995. A catch rate series was generated for the first six months of the year. While the 1995 decline in catch rate was not as pronounced as for the entire year, the January to June series did indicate a continual decline in catch rate since 1989 and a significant drop in 1995 (Fig. 4b). Catch rates for 3NOPs while showing stability since 1990 also declined significantly in 1995. Other factors affecting the catch rate may be the introduction of the more efficient circle hook in the mid 1980's and the release of halibut 81 cm. Although these effects cannot be quantified they could confound our perception of the stock. The introduction of the circle hook likely had a positive effect on commercial catch rates while the release of undersized halibut likely had a negative effect on these estimates.

Preliminary data on the release of small halibut from the Fishermen and Scientist Research Society (FSRS) in 1994 indicated that the amount released could be as high as 25% by weight of the total, for the <65' longline fleet landings. Although the numbers of vessels examined was small it does give some indication of the magnitude of the release of small halibut. No subsequent information on the release of small halibut was collected by the FSRS during the 1995 fishery.

With the 850 t quota in place for 1996, <65' fixed gear Management Harvesting Plans, will likely prosecute a fishery similar to that in 1995 using by-catch fisheries and catch and release programs in order to allow their fishery to continue throughout the year. The absence of a directed halibut fishery will impact our ability to use the commercial catch rate series to assess the halibut stocks.

Commercial Fishing Effort

Total estimated effort derived by dividing total landings by the directed CPUE (Table 8, Fig. 4c) for the whole stock area has shown a declining trend from 1985 to 1992, and remained more or less stable since 1992 and has increased slightly in 1995. For 4VWX, total effort increased since 1993 while effort remained relatively stable during the same time period in 3NOPs. In 1994 concern was expressed by the FRCC that a redirection of effort would occur as a result of closures in other groundfish fisheries. A large scale redirection of effort was not evident in 1994 or 1995, based on the reported landing statistics. However according to Industry reports misreporting of catch may have occurred in 1995 especially, because of the more restrictive quota.

Size Composition of Commercial Landings

A total of eleven halibut samples were collected for 1995, which was an improvement over previous years (Table 9). The commercial sampling indicates that both longline vessels and mobile gear vessels <65' are landing halibut greater than the 81 cm size limit (Fig. 5). In the past the mobile gear fleet landed more small halibut than the fixed gear fleet. This change to larger fish for mobile gear may be related to the use of dockside monitors for the ITQ fleet and better enforcement of the minimum size regulation. Examining the commercial length composition suggests that the proportion of mature (112 cm at 50% maturity) (Trumble *et al. 1993*) female biomass is currently at a very low level.

Sampling halibut landings continues to be difficult due to the small numbers landed, the difficulty handling the fish, and the practice of removing the head and tail prior to landing.

Geographical Distribution of Commercial Catches

Halibut catch distributions for the 1995 commercial longline fishery were compared to that for 1994. As only available log book information was used, the data are generally limited to the fishery distribution of the 45-65' fixed gear vessels, i.e., those that kept log books indicating positional information. It does not reflect the distribution of bycatches or that of the directed fishery by smaller longliners. The 4X fishery in 1994 was conducted in the Brown Bank area, and the mouth of the Bay of Fundy while in 4VW it occurred on the shelf edge and in the Sable Island Gully (Fig. 6). In 1995 little catch with associated positional information was reported from 4X. This was likely due to no positional information being collected for vessels using the weekly log, and not the absence of fishing in that area. In 1995 some of the 45-65' fleet fished in 4X. Although less directed catch was recorded in 1995, directed catch with corresponding effort information was higher in 1995 indicating that halibut was a by-catch species for much of the <45' longline fleet.

Geographical Distributions of Research Vessel Survey Catches

Research vessel survey distributions of Atlantic halibut (1970-1992) were examined last year (Annand and Beanlands 1993). In the spring, halibut in 4VW concentrate along the shelf edge and in the deeper water in the vicinity of the Gully and along the edge of Western Bank. In 4X halibut are most concentrated near Baccaro and Browns Banks, and as well extend up into the Bay of Fundy. Fall distribution is similar although concentrations in the Bay of Fundy are reduced. Summer distributions show reduced concentrations overall, but with a similar pattern. These patterns remained similar over time including the 1993-1995 period. However, in recent years fewer halibut were caught east of the Gully and along the edge in 4VSc (Fig. 7). Mean numbers per tow by strata for the summer survey are given in Table 11, and indicated that over time highest concentrations of halibut on the Scotian Shelf were found in strata 452 (The Gully), 463 (Emerald Basin) and 480 (Browns Bank).

Research Vessel Catch Rates

Mean numbers per tow (1970-1995) obtained from summer research vessel surveys on the Scotian Shelf (Table 12a, Fig. 8a) increased between 1970 and 1980 and subsequently declined to 1983. Since that time survey numbers per tow increased gradually to 1991 and declined thereafter. Spring and fall surveys (Table 12b, Fig. 8b) in 4VWX (1979-84) show a declining trend in numbers per tow to 1984, while the 4VW survey (1986-1995) was variable, with the 1995 survey point the lowest in the time series. Typically, the RV surveys catch very few fish making it difficult to interpret the results in terms of resource abundance. Generally the survey gear catches a different size distribution of halibut (smaller) than those directed for in the longline fishery (Fig. 9). Because, the survey catches smaller halibut, it was considered useful as an indicator of recruitment rather than resource abundance. Both spring and summer surveys indicate a decline in recruiting year-classes.

Prognosis

The change in management from a directed fishery in past years, to a mostly by-catch fishery in

1995, made it difficult to interpret the commercial catch rate data. In 1995 the TAC was reduced by over 40% and allocations became restrictive to the directed longline fishery and catches were substantially less than 850 t. This reduction in catch from levels of over 1,000 t in recent years to 700 t in 1995 did not appear to reduce effective fishing effort in 1995. Based on reports from Industry, some catch may have been misreported. Maintaining the 1995 TAC in 1996 under current allocations will likely result in catches less than 850 t. However, all biological indicators suggest a stock in a severely depressed state, and maintenance of the existing level of effort on this stock is likely to further the decline in this resource. There is a need to define effective management measures for the 1997 fishery to reduce the effort on this stock.

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Table 1. Halibut landings (t round fresh) by country for divisions 4VWX and divisions 3N0 and 3Ps.

	4VWX			3N0Ps			Total 4VWX + 3NOPs
Year	Canada	Foreign	Total	Canada	Foreign	Total	
1961	1498	78	1576	1230	468	1698	3274
1962	1660	40	1700	1194	339	1533	3233
1963	1453	80	1533	674	222	896	2429
1964	1461	90	1551	373	583	956	2507
1965	1574	35	1609	167	414	581	2190
1966	1030	146	1176	318	212	530	1706
1967	1236	12	1248	368	568	936	2184
1968	1175	42	1217	415	285	700	1917
1969	1024	57	1081	413	256	669	1750
1970	818	12	830	664	25	689	1519
1971	946	59	1005	481	100	581	1586
1972	825	25	850	402	89	491	1341
1973	765	9	774	452	42	494	1268
1974	641	13	654	345	136	481	1135
1975	638	12	650	332	87	419	1069
1976	708	6	714	269	76	345	1059
1977	705	8	713	576	27	603	1316
1978	1082	10	1092	337	8	345	1437
1979	1224	-	1224	420	3	423	1647
1980	1454	4	1458	255	40	295	1753
1981	1389	6	1395	217	27	244	1639
1982	1720	5	1725	468	54	522	2247
1983	1827	5	1832	253	193	446	2278
1984	1954	40	1994	871	182	1053	3047
1985	1940	28	1968	1591	472	2063	4031
1986	1609	23	1632	1492	221	1713	3345
1987	1161	22	1183	801	589	1390	2573
1988	1263	3	1266	765	277	1042	2308
1989	1156	2	1158	669	115	784	1942
1990	1094	6	1100	702	299	1001	2101
1991*	990	59	1049	429	690	1119	2168
1992*	931	42	973	338	62	400	1373
1993*	867	38	905	322	391	338	1618
1994*	861	1	862	162	82	244	1106
1995*	550	3	553	158	144	302	855

* Data from DFO Statistics Branch; provisional data for countries other than Canada.

Table 2. Halibut landings by division and year for all countires combined.

Year	4V	4W	4X	Total 4VWX	3N	3O	3Ps	Total 3N0Ps	Total
1961	415	544	617	1576	212	840	646	1698	3274
1962	294	621	785	1700	67	1180	286	1533	3233
1963	214	479	840	1533	125	561	210	896	2429
1964	332	358	861	1551	88	335	533	956	2507
1965	486	458	665	1609	66	341	174	581	2190
1966	527	318	331	1176	112	225	193	530	1706
1967	380	322	546	1248	234	372	330	936	2184
1968	250	363	604	1217	118	284	298	700	1917
1969	192	433	456	1081	91	298	280	669	1750
1970	115	349	366	830	133	246	310	689	1519
1971	231	360	414	1005	164	241	176	581	1586
1972	178	216	456	850	104	254	133	491	1341
1973	147	226	401	774	79	228	187	494	1268
1974	123	127	404	654	20	267	194	481	1135
1975	115	159	376	650	93	169	157	419	1069
1976	144	148	422	714	76	182	87	345	1059
1977	88	177	448	713	36	178	389	603	1316
1978	244	283	565	1092	43	137	165	345	1437
1979	230	358	636	1224	49	213	161	423	1647
1980	339	371	748	1458	46	104	145	295	1753
1981	250	379	766	1395	42	64	138	244	1639
1982	342	476	907	1725	63	288	171	522	2247
1983	419	546	867	1832	173	117	156	446	2278
1984	496	572	926	1994	279	463	311	1053	3047
1985	606	620	742	1968	516	1032	515	2063	4031
1986	553	579	500	1632	394	907	412	1713	3345
1987	345	354	484	1183	750	457	183	1390	2573
1988	298	360	608	1266	656	245	141	1042	2308
1989	300	415	443	1158	334	227	223	784	1942
1990	278	369	453	1100	492	325	184	1001	2101
1991*	221	456	372	1049	770	237	112	1119	2168
1992*	199	380	352	973[1]	164	175	61	400	1373
1993*	192	284	391	905[1]	113	547	53	713[1]	1618
1994*	219	282	361	862	84	92	68	244	1106
1995*	158	178	217	553	132	79	91	302	855

* Data from DFO Statistics Branch; provisional data for countries other than Canada.

[1] Includes catch where area not known.

Table 3a. Halibut landings for Canada (Maritimes and Quebec) for divisions 4VWX by quarter of year for 1970 - 1995.

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	59	19	23	7	108	122	119	88	18	347	44	134	121	64	363	818
1971	110	44	56	8	218	124	114	61	15	314	49	111	180	74	414	946
1972	58	31	83	6	178	26	77	78	12	193	38	135	220	61	454	825
1973	53	23	57	10	143	56	102	57	10	225	49	128	160	60	397	765
1974	43	27	40	8	118	7	47	67	6	127	21	96	184	95	396	641
1975	45	19	39	5	108	23	66	57	11	157	23	124	162	64	373	638
1976	50	45	44	3	142	8	88	47	4	147	35	113	179	92	419	708
1977	21	15	33	15	84	11	78	64	23	176	69	166	147	63	445	705
1978	35	88	55	66	244	24	139	99	14	276	54	206	224	78	562	1082
1979	47	90	62	31	230	20	253	78	7	358	65	260	206	105	636	1224
1980	83	140	74	40	337	40	209	91	31	371	85	317	196	148	746	1454
1981	75	86	72	13	246	78	197	73	31	379	127	273	242	122	764	1389
1982	44	154	113	31	342	69	199	176	31	475	117	283	335	168	903	1720
1983	48	227	104	39	418	86	277	164	18	545	129	289	340	106	864	1827
1984	103	197	140	18	458	61	199	295	17	572	119	176	442	187	924	1954
1985	143	313	123	14	593	52	252	279	23	606	90	179	374	98	741	1940
1986	107	322	96	12	537	47	252	259	14	572	62	128	248	62	500	1609
1987	71	153	88	16	328	37	176	127	9	349	49	172	211	52	484	1161
1988	84	114	71	26	295	11	155	188	6	360	80	201	263	64	608	1263
1989	99	121	52	26	298	75	133	191	16	415	83	137	174	49	443	1156
1990	116	106	37	16	275	52	108	190	16	366	73	128	192	60	453	1094
1991*	65	98	46	5	214	29	118	233	27	407	70	159	93	47	369	990
1992*	62	69	41	27	199	36	138	176	30	380	54	130	112	56	352	931
1993*	68	79	43	2	192	18	99	153	14	284	84	123	143	41	391	867
1994*	37	90	74	19	220	50	111	108	13	282	32	103	151	75	361	862
1995*	78	45	28	7	158	45	76	46	8	175	31	77	75	34	217	550

Table 3b. Halibut landings for Canada (Maritimes and Quebec) for divisions 3NOPs by quarter of year for 1970 - 1995.

	3N					30					3Ps					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	82	32	14	5	133	141	34	21	50	246	162	16	44	63	285	664
1971	34	69	18	7	128	58	25	51	58	192	86	52	15	8	161	481
1972	4	20	12	7	43	56	36	32	104	228	61	20	27	23	131	402
1973	1	4	40	11	56	86	73	34	32	225	87	26	36	22	171	452
1974	5	3	4	3	15	71	63	18	2	154	59	74	27	16	176	345
1975	0	34	21	16	71	36	34	18	17	105	32	88	30	6	156	332
1976	8	47	2	1	58	54	51	18	5	128	16	22	32	13	83	269
1977	4	13	0	4	21	43	36	39	55	173	59	168	30	125	382	576
1978	10	16	6	8	40	25	74	22	12	133	20	67	55	22	164	337
1979	1	23	13	12	49	20	102	41	50	213	55	69	17	17	158	420
1980	10	7	9	20	46	4	25	46	21	96	22	37	30	24	113	255
1981	0	9	13	11	33	27	16	12	9	64	50	47	20	3	120	217
1982	0	2	7	26	35	71	193	8	7	279	21	81	33	19	154	468
1983	3	17	3	2	25	55	33	17	4	109	38	39	31	11	119	253
1984	3	80	131	1	215	63	174	96	85	418	44	78	40	76	238	871
1985	25	94	93	74	286	182	394	167	134	877	120	155	94	59	428	1591
1986	0	57	199	7	263	376	255	180	32	843	149	167	59	11	386	1492
1987	21	142	160	7	330	115	177	41	5	338	46	53	27	7	133	807
1988	72	182	153	30	437	84	100	22	30	236	45	19	19	9	92	765
1989	59	136	77	11	283	69	101	35	7	212	64	75	26	9	174	669
1990	22	116	54	8	200	110	130	65	13	318	79	77	23	5	184	702
1991*	2	46	17	19	84	58	132	25	18	233	55	29	24	4	112	429
1992*	15	35	40	12	102	53	68	37	17	175	11	35	7	8	61	338
1993*	22	24	14	1	61	63	61	34	49	207	26	11	15	2	54	322
1994*	11	8	0	0	19	20	33	12	9	74	9	38	17	4	68	161
1995*	3	-	1	-	4	23	12	19	9	63	46	34	8	3	91	158

* Provisional - 1993 data from IOP.
! Area not known.

Table 3c. Halibut landings for all Foreign Countries combined for divisions 4VWX by quarter of year for 1970 - 1995.

	4V						4W						4X						
	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	1st Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	Total
1970	3	2	2	0		7	-	2	-	-		2	0	2	0	1		3	12
1971	0	0	6	7		13	2	44	0	0		46	-	-	-	-		-	59
1972	-	-	-	-		-	1	1	0	1	20	23	2	0	0	0		2	25
1973	3	1	0	0		4	0	1	0	0		1	2	1	0	1		4	9
1974	0	0	2	3		5	-	-	-	-		-	6	2	0	0		8	13
1975	3	1	3	-		7	0	1	0	0	1	2	1	0	0	0	2	3	12
1976	2	-	-	-		2	0	0	0	0	1	1	1	0	0	0	2	3	6
1977	4	-	-	-		4	-	1	-	-		1	1	0	0	0	2	3	8
1978	-	-	-	-		-	-	-	4	3		7	1	0	0	0	2	3	10
1979	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-
1980	2	-	-	-		2	-	-	-	-		-	0	0	0	1	1	2	4
1981	3	1	0	0		4	-	-	-	-		-	0	0	1	0	1	2	6
1982	-	-	-	-		-	-	-	1	-		1	0	0	1	0	3	4	5
1983	1	-	-	-		1	-	-	1	-		1	0	0	0	0	3	3	5
1984	32	-	2	4		38	-	-	-	-		-	0	0	0	0	2	2	40
1985	1	6	1	5		13	-	14	-	-		14	0	0	0	0	1	1	28
1986	4	4	5	3		16	0	7	0	0		7	-	-	-	-	-	-	23
1987	1	4	12	0		17	0	5	0	0		5	-	-	-	-	-	-	22
1988	0	1	1	1		3	-	-	-	-		-	-	-	-	-	-	-	3
1989	-	-	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
1990	-	-	3	-	-	3	-	3	-	-	-	3	-	-	-	-	-	-	6
1991*	-	-	-	-	7	7	-	-	-	-	49	49	-	-	-	-	3	3	59
1992*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42[1]
1993*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38[1]
1994*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
1995*	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-	0	0	3

Table 3d. Halibut landings for all Foreign Countries combined for divisions 3NOPs by quarter of year for 1970 - 1995.

	3N						30						3Ps						
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	NK	Total	Total
1970	-	-	-	-		-	-	-	-	-		-	17	6	2	0		25	25
1971	-	15	21	0		36	0	48	1	0		49	14	1	0	0		15	100
1972	18	7	2	34		61	0	14	0	12		26	2	0	0	0		2	89
1973	1	3	19	0		23	0	0	3	0		3	2	7	6	1		16	42
1974	0	0	5	0		5	51	17	45	0		113	11	5	0	2		18	136
1975	15	0	7	0		22	5	47	12	0		64	1	-	-	-		1	87
1976	18	-	-	-		18	54	-	-	-		54	-	1	3	-		4	76
1977	-	5	10	-		15	5	-	-	-		5	5	2	-	-		7	27
1978	-	2	-	1		3	-	4	-	-		4	1	-	-	-		1	8
1979	-	-	-	-		-	-	-	-	-		-	2	1	-	-		3	3
1980	-	-	-	-		-	-	2	-	6		8	6	7	8	11		32	40
1981	0	1	6	2		9	-	-	-	-		-	5	4	0	9		18	27
1982	2	19	5	2		28	-	7	2	-		9	6	11	-	-		17	54
1983	17	100	4	27		148	6	2	-	-		8	1	24	9	3		37	193
1984	-	19	11	34		64	-	1	6	38		45	53	15	4	1		73	182
1985	41	85	74	29	1	230	66	25	25	39		155	33	48	6	-		87	472
1986	52	43	26	7	3	131	11	28	15	10		64	9	8	6	3		26	221
1987	66	187	72	94	1	420	37	47	27	8		119	19	22	1	8		50	589
1988	91	83	16	16	13	219	0	5	0	4		9	37	8	1	3		49	277
1989	-	-	-	-	51	51	-	-	-	-	15	15	-	-	-	-	49	49	115
1990	60	84	73	75	-	292	-	1	5	1	-	7	-	-	-	-		-	299
1991*	-	-	-	-	686	686	-	-	-	-	4	4	-	-	-	-		-	690
1992*	-	-	-	-	62	62	-	-	-	-	-	-	-	-	-	-		-	62
1993*	-	-	-	-	52	52	-	-	-	-	339	339	-	-	-	-	-	-	391
1994*	7	27	17	13	-	64	1	8	3	6	-	18	-	-	-	-	-	-	82
1995*	40	20	60	-	8	128	3	3	6	-	4	16	-	-	-	-	-	-	144

* Provisional - 1993 data from IOP.

[1] Area not known.

Table 4a. Halibut landings by otter trawlers <150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	-	-	-	-	-	-	1	-	-	1	5	7	1	1	14	15
1971	-	-	-	-	-	-	1	-	-	1	1	8	19	1	29	30
1972	-	-	-	-	-	-	-	-	-	-	0	2	0	0	2	2
1973	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-	-	-	0	3	1	0	4	4
1975	-	-	-	-	-	-	1	-	-	1	-	11	6	2	19	20
1976	-	-	-	-	-	-	-	-	-	-	0	2	1	1	4	4
1977	-	-	-	-	-	0	0	0	1	1	1	7	6	2	16	17
1978	-	-	-	-	-	-	-	-	-	-	1	7	6	2	16	16
1979	-	-	-	-	-	0	0	2	-	2	3	35	13	5	56	58
1980	0	1	0	0	1	0	5	0	0	5	4	43	12	8	67	73
1981	-	-	-	-	-	1	3	0	0	4	14	18	19	4	55	59
1982	-	-	-	-	-	3	5	0	0	8	7	28	16	6	57	65
1983	-	-	-	-	-	1	2	0	0	3	15	36	20	4	75	78
1984	-	-	-	-	-	0	2	0	-	2	16	20	19	1	56	58
1985	-	-	-	-	-	0	2	0	0	2	9	15	8	2	34	36
1986	1	0	0	0	1	-	-	-	-	-	10	8	4	1	23	24
1987	-	-	-	-	-	0	2	0	0	2	11	11	4	0	26	28
1988	-	-	-	-	-	0	6	0	0	6	21	34	3	2	60	66
1989	-	-	-	-	-	0	5	0	0	5	28	17	2	1	48	53
1990	4	5	1	0	10	0	0	0	0	0	25	16	16	14	71	81
1991*	0	0	0	0	0	0	1	1	0	2	31	29	10	18	88	90
1992*	0	0	0	0	0	0	0	0	0	0	27	27	14	15	83	83
1993*	-	0	0	0	0	0	-	-	-	0	61	41	5	1	108	108
1994*	0	1	1	0	2	0	0	0	0	0	17	13	8	0	38	40
1995*	1	1	2	0	4	0	0	0	0	0	20	8	1	0	29	33

Table 4b. Halibut landings by otter trawlers of >150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	16	7	2	6	31	49	27	16	7	99	18	28	7	19	72	202
1971	31	15	4	0	50	87	40	8	4	139	35	31	5	8	79	268
1972	22	10	2	0	34	16	7	11	9	43	20	15	8	2	45	122
1973	8	2	0	1	11	22	10	3	3	38	36	10	1	3	50	99
1974	12	11	1	3	27	2	0	1	2	5	3	2	5	10	20	52
1975	10	16	6	1	33	3	10	-	3	16	4	9	20	17	50	99
1976	14	12	20	2	48	0	2	1	3	6	16	13	36	26	91	145
1977	7	9	13	14	43	3	5	11	13	32	35	21	2	13	71	146
1978	20	62	23	10	115	12	32	15	8	67	20	22	4	9	55	237
1979	21	26	20	30	97	4	21	16	3	44	24	22	3	41	90	231
1980	30	45	31	35	141	33	35	16	28	112	22	6	3	33	64	317
1981	23	38	19	13	93	45	42	8	8	103	25	11	0	13	49	245
1982	27	65	47	26	165	15	31	8	7	61	18	5	5	10	38	264
1983	16	30	29	30	105	19	29	13	1	62	16	3	3	1	23	190
1984	33	19	8	5	65	6	7	1	0	14	6	2	1	0	9	88
1985	61	55	15	8	139	0	1	1	0	2	3	0	0	0	3	144
1986	19	48	8	4	79	1	0	0	1	2	1	1	0	0	2	83
1987	19	15	8	1	43	-	-	-	-	-	1	0	0	0	1	44
1988	8	6	0	0	14	2	0	1	0	3	-	-	-	-	-	17
1989	4	3	4	1	12	-	-	-	-	-	-	-	-	-	-	12
1990	14	11	0	1	26	0	0	0	0	0	0	0	0	0	0	26
1991*	16	15	5	1	37	0	1	40	6	47	0	1	2	1	4	88
1992*	7	5	0	3	15	2	27	0	0	29	1	1	0	0	2	46
1993*	6	5	-	1	12	0	5	19	0	24	0	1	1	0	2	38
1994*	3	2	1	1	7	0	1	1	0	2	0	1	0	1	2	11
1995*	17	2	1	3	23	3	0	0	0	3	1	0	0	1	2	28

* Data from DFO Statistics Branch.

Table 4c. Halibut landings by longline and handline boats <150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	36	8	21	1	66	64	88	70	11	233	18	88	108	43	257	556
1971	62	19	36	-	117	29	67	51	11	158	12	63	149	65	289	564
1972	21	7	65	0	93	0	53	58	3	114	18	97	198	59	372	579
1973	37	11	49	2	99	32	80	49	7	168	13	116	157	57	343	610
1974	25	7	21	0	53	2	43	57	2	104	18	83	172	83	356	513
1975	28	2	24	-	54	12	47	57	8	124	19	100	134	45	298	476
1976	28	16	24	1	69	7	77	44	1	129	19	91	140	63	313	511
1977	14	6	16	1	37	8	67	47	7	129	32	122	119	44	317	483
1978	14	10	11	0	35	10	91	71	2	174	32	155	196	58	441	650
1979	25	27	32	1	85	16	213	57	4	290	35	167	183	51	436	811
1980	34	39	28	2	103	6	159	55	3	223	57	241	172	106	576	902
1981	17	39	44	0	100	32	149	62	21	264	87	231	210	102	630	994
1982	3	72	53	4	132	49	159	166	24	398	90	242	308	150	790	1320
1983	10	180	75	6	271	62	243	148	13	466	97	242	301	97	737	1474
1984	41	171	132	12	356	48	165	292	17	522	96	153	416	176	841	1719
1985	47	254	103	5	409	51	249	277	22	599	71	155	360	91	677	1685
1986	40	271	88	6	405	42	245	251	13	551	45	111	232	54	442	1398
1987	21	134	78	4	237	37	173	126	8	344	37	146	206	52	441	1022
1988	39	107	71	26	243	8	149	185	4	346	59	167	254	62	542	1131
1989	30	114	43	9	196	75	121	189	16	401	55	120	171	48	394	991
1990	28	89	36	7	160	52	107	189	15	363	45	112	173	46	376	899
1991*	26	78	40	1	145	29	115	189	21	354	38	124	79	27	268	767
1992*	36	62	40	23	161	32	107	172	30	341	25	100	96	41	262	764
1993*	42	72	40	0	154	18	93	133	13	257	22	79	136	39	276	687
1994*	38	84	72	18	207	49	109	107	13	278	14	86	141	73	314	799
1995*	41	36	25	4	106	37	76	48	7	165	9	68	73	33	183	454

Table 4d. Halibut landings by longline and handline boats of <150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	7	4	-	-	11	9	3	-	-	12	3	1	-	-	4	27
1971	17	10	16	8	51	8	4	1	-	13	1	-	-	-	1	65
1972	15	14	16	6	51	10	9	3	0	22	0	7	0	0	7	80
1973	8	10	8	7	33	1	9	2	0	12	-	-	-	-	-	45
1974	6	8	15	3	32	3	0	1	0	4	0	1	0	0	1	37
1975	7	1	9	4	21	7	6	-	-	13	-	-	-	-	-	34
1976	7	17	0	0	24	1	8	0	-	9	-	-	-	-	-	33
1977	0	0	4	0	4	0	2	-	-	2	0	2	-	-	2	8
1978	1	11	20	2	34	1	2	1	1	5	-	-	-	-	-	39
1979	1	37	10	0	48	0	6	0	0	6	1	1	0	4	6	60
1980	19	55	15	3	92	1	3	18	0	22	2	3	0	0	5	119
1981	35	9	9	0	53	0	1	1	0	2	-	-	-	-	-	55
1982	14	17	13	1	45	2	4	0	0	6	-	-	-	-	-	51
1983	22	17	0	3	42	4	1	0	3	8	-	-	-	-	-	50
1984	29	7	0	1	37	7	21	0	-	28	1	0	0	9	10	75
1985	35	4	5	1	45	1	0	0	0	1	5	0	0	3	8	54
1986	47	2	0	2	51	1	0	0	0	1	-	-	-	-	-	52
1987	31	4	2	11	48	-	-	-	-	-	-	-	-	-	-	48
1988	37	1	0	0	38	-	-	-	-	-	-	-	-	-	-	38
1989	65	4	5	16	90	-	-	-	-	-	-	-	-	-	-	90
1990	70	1	0	8	79	-	0	-	1	1	-	-	-	-	-	80
1991*	23	5	1	2	31	-	0	-	0	0	-	-	-	-	-	31
1992*	19	2	1	1	23	2	1	1	-	4	0	0	-	-	0	27
1993*	20	2	2	1	25	0	0	-	1	1	-	0	-	0	0	26
1994*	1	2	0	-	3	0	0	-	-	0	0	0	0	-	0	3
1995*	20	7	-	-	27	5	-	-	-	5	0	-	-	-	0	32

* Data from DFO Statistics Branch.

Table 4e. Halibut landings for other gear, all tonnage classes combined by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	4V					4W					4X					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Canadian Total
1970	-	-	-	-	-	-	-	2	-	2	-	10	5	1	16	18
1971	-	-	-	-	-	-	2	1	-	3	-	9	7	-	16	19
1972	-	-	-	-	-	0	8	6	0	14	0	14	0	0	28	42
1973	-	-	-	-	-	1	3	3	0	7	0	2	2	0	4	11
1974	0	1	3	2	6	0	4	8	2	14	0	7	6	2	15	35
1975	-	-	-	-	-	1	2	-	-	3	-	4	2	-	6	9
1976	1	0	0	0	1	0	1	2	0	3	0	7	2	2	11	15
1977	-	-	-	-	-	0	4	6	2	12	1	14	20	4	39	51
1978	0	5	[illegible]	54	60	1	14	12	3	30	1	22	18	9	50	140
1979	-	-	-	-	-	0	13	3	0	16	2	35	7	4	48	64
1980	-	-	-	-	-	0	7	2	0	9	0	24	9	1	34	43
1981	-	-	-	-	-	0	2	2	2	6	1	13	13	3	30	36
1982	-	-	-	-	-	0	0	2	0	2	2	8	6	2	18	20
1983	-	-	-	-	-	0	2	3	1	6	1	8	16	4	29	30
1984	-	-	-	-	-	0	4	2	0	6	0	1	6	1	8	14
1985	-	-	-	-	-	0	0	1	1	2	2	9	6	2	19	21
1986	0	1	0	0	1	3	7	8	0	18	6	8	12	7	33	51
1987	-	-	-	-	-	0	1	1	1	3	0	15	1	0	16	19
1988	-	-	-	-	-	1	0	2	2	5	0	0	6	0	6	11
1989	-	-	-	-	-	0	7	2	0	9	0	0	1	0	1	10
1990	0	0	0	0	0	0	1	1	0	2	3	0	3	0	6	8
1991*	0	1	0	0	1	0	1	3	0	4	1	5	2	1	9	14
1992*	0	0	0	0	0	-	1	3	0	3	-	2	3	0	4	7
1993*	0	1	0	-	1	-	1	1	0	2	1	1	2	1	5	8
1994*	0	0	0	-	0	-	0	0	0	0	0	0	0	1	1	1
1995*	1	0	1	0	2	-	0	0	0	0	0	0	1	0	1	3

* Data from DFO Statistics Branch.

Table 5a. Halibut landings by longline and handline boats <150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	3N					3O					3Ps					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	70	23	-	-	93	79	34	-	-	113	5	7	5	-	17	223
1971	34	69	7	-	110	39	21	38	7	105	16	26	14	-	56	271
1972	1	0	0	0	1	42	20	6	1	69	37	13	7	1	58	128
1973	-	-	-	-	-	7	14	24	11	56	5	14	3	3	25	81
1974	-	-	-	-	-	12	15	6	1	34	10	6	3	2	21	55
1975	-	3	1	-	4	7	12	12	2	33	6	6	10	1	23	60
1976	0	14	1	1	16	13	4	3	0	20	3	2	3	0	8	44
1977	-	-	-	-	-	4	3	2	0	9	4	11	8	0	23	32
1978	-	-	-	-	-	1	3	5	0	9	0	12	4	2	18	27
1979	-	-	-	-	-	0	12	0	1	13	1	3	0	0	4	17
1980	-	-	-	-	-	3	13	0	0	16	2	10	7	3	22	38
1981	-	-	-	-	-	-	-	-	-	-	1	14	1	1	17	27
1982	-	-	-	-	-	-	-	-	-	-	2	12	14	1	29	29
1983	-	-	-	-	-	0	3	15	-	18	6	28	10	0	44	62
1984	0	79	56	0	135	1	74	56	2	133	5	53	9	0	67	335
1985	19	32	64	32	147	0	143	120	47	310	1	87	35	2	125	582
1986	0	32	170	3	205	0	55	146	0	201	41	114	50	3	208	614
1987	0	87	93	3	183	8	31	24	0	63	2	26	6	1	35	281
1988	0	80	105	1	186	6	44	13	1	64	15	5	16	0	36	286
1989	8	87	55	5	155	5	60	19	0	84	14	54	4	0	72	311
1990	3	77	23	2	105	10	52	30	1	93	4	10	7	0	21	219
1991*	-	7	-	-	7	3	28	6	7	44	1	9	19	1	30	81
1992*	-	7	14	-	21	1	22	27	-	50	11	13	3	1	28	99
1993*	1	20	6	1	28	2	29	11	-	42	2	7	0	0	9	79
1994*	-	8	-	0	8	-	22	1	-	23	-	-	-	0	0	31
1995*	-	-	-	-	-	0	6	4	7	17	10	4	2	1	17	34

Table 5b. Halibut landings by longline and handline boats >150 GRT by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec).

	3N					3O					3Ps					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	7	6	-	-	13	7	-	-	-	7	6	-	-	-	6	26
1971	-	-	-	-	-	14	4	2	1	21	6	21	-	-	27	48
1972	3	18	0	0	21	3	2	3	1	9	6	0	7	1	14	44
1973	0	3	30	0	33	11	40	4	8	63	18	1	2	8	29	125
1974	-	-	-	0	-	14	33	8	1	56	14	5	9	6	34	90
1975	-	27	-	-	28	28	4	2	14	48	5	2	5	2	14	90
1976	0	23	0	0	23	29	1	0	5	35	3	1	1	0	5	63
1977	0	10	0	1	11	17	6	5	13	41	1	1	3	0	5	57
1978	9	9	0	0	18	15	2	0	2	19	0	1	8	0	9	46
1979	-	14	-	-	14	15	0	0	0	15	6	0	0	0	6	35
1980	10	3	5	0	18	0	0	0	11	11	0	0	4	0	4	33
1981	0	8	0	0	8	16	2	1	4	23	2	6	4	1	13	44
1982	0	1	0	0	1	14	9	0	0	23	0	12	9	0	21	45
1983	0	14	0	2	16	10	13	2	1	26	3	6	9	0	18	60
1984	0	0	74	0	74	9	98	36	0	143	26	8	0	14	48	265
1985	2	57	27	39	125	8	59	19	19	105	36	19	7	3	65	295
1986	0	19	24	0	43	36	119	18	23	196	27	11	0	4	42	281
1987	21	50	59	3	133	57	47	15	2	121	15	18	12	4	49	303
1988	72	102	46	27	247	53	42	9	29	133	15	7	2	6	30	410
1989	51	47	21	5	124	46	23	14	5	88	40	8	20	4	72	284
1990	19	39	31	6	95	65	42	33	11	151	48	48	16	5	117	363
1991*	2	37	16	19	74	33	27	19	10	89	19	10	3	3	35	198
1992*	15	28	25	12	80	28	30	7	10	75	10	9	2	6	27	182
1993*	20	3	8	0	31	53	22	18	1	94	13	2	12	1	28	153
1994*	11	0	-	0	11	18	3	7	8	36	9	24	13	1	47	94
1995*	3	0	-	-	3	22	2	12	1	37	33	17	1	-	51	91

* Data from DFO Statistics Branch.

Table 5c. Halibut landings for all other gears by quarter of year for 1970 - 1995 for Canada (Maritimes and Quebec), includes unknown TC.

	3N					3O					3Ps					
Year	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	1st Quart.	2nd Quart.	3rd Quart.	4th Quart.	Total	Total
1970	5	3	14	5	27	55	-	21	50	126	151	9	39	63	262	415
1971	0	0	11	7	18	5	0	11	50	66	64	5	1	8	78	162
1972	0	2	12	7	21	11	14	23	102	150	18	7	13	21	59	230
1973	1	1	10	11	23	68	19	6	13	106	64	11	31	11	117	246
1974	5	3	4	3	15	45	15	4	0	64	35	63	15	8	121	200
1975	0	4	20	15	39	1	18	4	1	24	21	80	15	3	119	182
1976	8	10	1	0	19	12	46	15	0	73	10	19	28	13	70	162
1977	4	3	0	3	10	22	27	32	42	123	54	156	19	125	354	487
1978	1	7	6	8	22	9	69	17	10	105	20	54	43	20	137	264
1979	1	9	13	12	35	5	90	41	49	185	48	66	17	17	148	368
1980	0	4	4	20	28	1	12	46	10	69	20	27	19	21	87	184
1981	0	1	13	11	25	11	14	11	5	41	47	27	15	1	90	156
1982	0	1	7	26	34	57	184	8	7	256	19	57	10	18	104	394
1983	3	3	3	0	9	45	17	0	3	65	29	5	12	11	57	131
1984	3	1	1	1	6	53	2	4	83	142	13	17	31	62	123	271
1985	4	5	2	3	14	174	192	28	68	462	83	49	52	54	238	714
1986	0	6	5	4	15	340	81	16	9	446	81	42	9	4	136	597
1987	0	5	8	1	14	50	99	2	3	154	29	9	9	2	49	217
1988	0	0	2	2	4	25	14	0	0	39	15	7	1	3	26	69
1989	0	2	1	1	4	18	18	2	2	40	10	13	2	5	30	74
1990	0	0	0	0	0	35	36	2	1	74	27	19	1	0	46	120
1991*	0	3	0	0	3	22	77	1	0	100	35	9	2	1	47	150
1992*	0	0	0	0	0	24	16	3	6	49	22	8	1	1	32	81
1993*	0	0	1	0	1	9	10	5	48	72	11	3	3	0	17	90
1994*	0	0	0	0	0	2	7	4	0	12	0	13	3	2	18	30
1995*	0	0	1	-	1	1	4	1	1	7	3	12	5	2	22	30

* Data from DFO Statistics Branch.

Table 6. Management Table for halibut 1995 (Allocation and catch)

Year	Fleet	Quota (t)	Reported catch (t) Quota Reports	Percent taken (%)	Remarks
1995	**All Vessels**	850	720	85	
	3N0 FG<65'	46	16	35	
	3Ps FG<65'	22	14	64	
	4VWX FG <65'	449	446	99	
	3Ps MG <65'	3	1	33	bycatch fishery only
	4VWX MG <65'	22	28	127	bycatch fishery only
	3N0Ps, 4VWX FG 65-100'	167	179	107	
	3N0Ps, 4VWX MG 65-100'	3	2	67	bycatch fishery only
	3NOPs, 4VWX All Vessels >100'	138	34	25	bycatch fishery only

Stock	Gear	Date	Licence Condition/ Variation Order	Remarks
4VsW halibut	LL <45' A2	January 9	Licence Condition	No limit
	LL <45' A3	March 16	Licence Condition	Industry trip limit
4VWX5 halibut	FG <45 - 65' A14	June 4	Variation Order	Closed
		June 28	Variation Order	Opened - by catch only
4VWX5 halibut	MG < 65' C1-C6000	April 28	Variation Order	Closed
4VWX53NOPS halibut	FG 65-100'	August 18	Variation Order	Closed to all groundfish

Note: Other than the above, the halibut fishery was regulated as part of the groundfish management plan for each quota group or fleet. Details may be obtained from Annand and Hansen 96/ .

Table 7. Atlantic halibut CPUE 3NOPs for LL all TC where halibut was main species.

Year	Catch	Effort (000' hooks)	CPUE
1985	480	6899	.069
1986	406	3292	.123
1987	233	1647	.141
1988	266	1810	.147
1989	185	1414	.131
1990	173	1782	.097
1991	127	1602	.079
1992	123	1269	.097
1993	111	1259	.089
1994	64	669	.096
1995	76	1231	.061

Atlantic halibut CPUE 4VWX 3NOPs for LL all TC where halibut was main species.

Year	Catch	Effort (000' hooks)	CPUE
1985	1265	17083	.074
1986	1096	14323	.076
1987	536	6385	.083
1988	530	4937	.107
1989	432	5174	.084
1990	356	4463	.080
1991	257	3814	.067
1992	334	4414	.076
1993	290	4557	.063
1994	190	2843	.067
1995	210	5855	.036

Atlantic halibut CPUE (4VWX) for LL all TC where halibut was main species (data prior to 1986 from Neilson *et al.* 1987).

Year	Catch	Effort (000' hooks)	CPUE
1970	131	2374	.055
1971	146	2277	.064
1972	199	3099	.064
1973	212	3653	.058
1974	172	3198	.054
1975	111	2082	.053
1976	110	1848	.060
1977	82	1477	.056
1978	68	1127	.060
1979	179	1991	.088
1980	176	2004	.092
1981	115	1253	.078
1982	220	2820	.075
1983	606	8040	.077
1984	800	11985	.067
1985	785	10185	.077
1986	691	11031	.061
1987	303	4738	.063
1988	264	3127	.084
1989	247	3760	.066
1990	183	2681	.068
1991	129	2212	.058
1992	210	3145	.067
1993	177	3298	.054
1994	125	2174	.058
1995	135	4624	.029

Table 8a. Atlantic halibut January to June CPUE (4VWX) for LL all TC where halibut was main species.

Year	Catch	Effort	CPUE
1989	176	2579	.068
1990	116	1556	.075
1991	78	1432	.055
1992	108	1996	.054
1993	129	2679	.048
1994	93	1895	.049
1995	120	3893	.031

8b. Estimated total domestic effort (000's hooks).

Year	4VWX	3NOPs	4VWX3NOPs
1985	22584	12710	35351
1986	23770	7276	30855
1987	16984	4142	19927
1988	13916	4735	14429
1989	16378	4542	19952
1990	14397	6000	19512
1991	13758	3531	16075
1992	11805	2896	14105
1993	13203	2606	15000
1994	13827	1302	15347
1995	16759	2032	18791

Table 9. Halibut samples for 4VWX.

Year	Longline	Otter Trawl
1990	1	-
1991	1	1
1992	-	1
1993	1	1
1994	6	2
1995	10	1

Table 10. Mean number/tow for 4VWX halibut in Canadian summer bottom trawl surveys (Strata 440 - 495) [1].

Stratum	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.26	0	0	0	0
441	0	0	0	0	0	0	0	0	.28	0	0	0	0	0	0	.21	0	0	0	0	0	0	0	0	0	0
442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
443	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
445	0	.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
446	0	0	0	0	0	0	.32	0	.25	0	0	0	0	.32	0	.26	0	0	0	0	.32	.34	5.15	0	.27	0
447	0	0	0	0	0	0	.23	0	0	0	.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
448	0	0	0	.45	0	0	0	0	0	0	.22	0	0	0	.24	0	0	0	0	0	0	0	0	0	0	0
449	0	.49	0	1.75	.39	0	0	0	0	.55	1.97	.49	0	0	.49	0	0	0	0	0	0	.51	0	0	0	0
450	0	0	.31	0	.63	1.54	.34	3.65	.32	1.17	1.48	1.98	2.39	1.72	.32	.32	.34	0	1.03	.34	.69	.34	0	0	0	1.66
451	0	.88	1.17	2.19	0	2.02	3.83	.97	0	1.94	.42	0	.34	0	0	0	0	1.64	0	3.83	2.09	-	1.49	0	4.96	1.94
452	0	0	.58	0	0	1.92	1.46	0	1.94	5.51	1.47	0	2.57	1.90	2.70	0	0	.69	3.80	6.18	2.38	8.00	2.06	6.69	1.55	2.49
453	0	.44	0	.92	0	.29	0	.34	.32	2.92	.45	.36	0	1.09	1.56	0	0	0	0	.51	0	1.09	.49	0	1.52	0
454	0	0	1.01	.53	0	.34	1.17	0	.97	0	.31	0	0	1.03	0	0	2.06	1.03	.51	1.54	.32	0	0	0	0	0
455	0	0	.13	.27	1.06	.15	0	0	.25	.69	0	.61	.26	0	.14	.14	0	.27	.58	.14	0	0	0		.10	0
456	0	0	0	.40	.58	.79	.23	.21	.16	.17	.29	.59	0	0	.17	0	.59	1.04	0	.17	0	.15	.14	.11	.39	.12
457	0	0	0	.51	0	0	.95	.51	0	0	.40	1.49	0	0	0	0	0	.27	0	0	.24	1.03	0	.49	0	0
458	0	0	0	.58	0	0	.61	1.10	.58	0	0	0	0	0	0	.34	0	0	0	.32	.27	0	0	0	0	0
459	0	0	0	0	0	0	.20	0	0	.29	.51	.58	0	0	.26	0	0	0	0	.22	.21	.22	.32	0	0	0
460	0	0	0	0	0	0	0	0	0	0	2.02	0	1.03	0	0	0	0	0	0	.34	0	0	0	.33	0	.34
461	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0
462	.58	0	0	0	0	0	.55	.19	0	.24	.31	.44	.82	0	0	0	0	0	0	.76	.19	1.07	.24	.50	0	.25
463	1.32	.97	1.31	.69	0	3.58	1.46	2.30	2.10	1.26	.38	1.03	0	0	.51	0	1.03	5.15	3.83	0	2.47	.51	1.52	.46	0	0
464	.80	0	.39	.52	.34	1.29	1.32	.65	.27	.51	.17	.40	.50	0	.62	1.37	1.45	.16	1.20	.61	.12	.59	.42	.14	.42	.30
465	.31	.58	0	0	0	.29	.96	.39	0	.84	.32	0	.45	.18	.44	.19	1.44	.68	.13	1.17	.49	.53	.60	.30	.60	.61
466	0	0	.32	0	0	0	0	0	0	.36	0	0	.69	0	0	0	0	0	0	0	0	0	-	.50	0	0
470	0	0	0	0	0	0	0	.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.49	0	0	0
471	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
473	0	0	0	0	.36	.46	0	1.61	.51	.51	0	0	.51	0	0	0	0	.51	0	0	0	0	.24	0	.74	0
474	.51	.69	1.31	1.26	3.28	.92	3.09	4.01	3.09	1.17	1.03	.69	.51	0	0	0	0	1.06	0	0	0	0	0	0	0	0
475	.55	.80	.67	0	2.81	1.02	1.34	1.09	.42	2.16	.92	.46	.51	.98	-	.49	.51	0	1.03	0	1.46	0	.49	.49	0	0
476	0	0	0	0	0	0	0	.27	0	1.03	1.17	0	0	0	0	.51	0	0	0	0	0	0	.49	0	0	0
477	.38	.55	.82	0	.42	0	1.06	0	2.52	0	.31	2.26	.92	0	.51	.49	.51	.64	0	.73	1.03	.97	.57	.76	.40	0
478	.69	0	0	0	0	0	0	.22	.58	1.90	.36	.83	.75	.36	1.03	0	.36	0	0	0	0	0	.93	0	0	0
480	1.40	5.35	.77	2.21	1.66	3.65	3.36	18.55	4.62	.24	2.32	1.54	.51	0	0	1.90	1.99	.53	.81	4.97	2.96	.42	0	1.27	.50	1.52
482	0	0	0	0	0	0	0	0	0	0	0	0	.44	0	0	0	0	0	0	0	0	0	0	.34	.33	0
483	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.44	0	0	0	0	0	0	0	0	0	0	0
484	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
485	0	0	0	0	0	0	0	0	0	0	0	0	.49	0	0	0	0	0	.03	0	0	.88	.32	0	0	.67
490	.51	0	0	0	3.06	1.71	0	.27	.56	1.15	2.16	0	0	0	0	0	.36	0	.26	0	2.33	.73	1.09	.45	1.00	.20
491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.32	0	0	0	0	0	0	0	0	0	0
493	0	0	0	0	0	0	0	0	0	.49	0	0	0	0	0	0	0	0	0	0	.31	0	1.03	.32	0	0
494	0	0	.63	0	0	2.18	0	.58	0	0	0	0	.46	0	0	.49	.51	0	0	0	0	0	0	0	0	0
495	0	0	0	2.19	0	0	0	0	0	2.19	.58	0	.49	0	0	0	0	0	.46	.55	0	1.38	0	0	0	0

[1] Survey Vessels 1970-1981 A.T. Cameron
1982 Lady Hammond
1983-1995 Alfred Needler

Table 11a. Summer survey results for 4VWX halibut (1970-1995).

Year	Mean Number/Tow (Standard Error)	Mean Weight/Tow (kg) (Standard Error)
1970	.12 (.04)	.38 (.15)
1971	.13 (.06)	.23 (.08)
1972	.10 (.02)	.28 (.10)
1973	.15 (.04)	.26 (.07)
1974	.21 (.06)	.40 (.14)
1975	.22 (.05)	.29 (.07)
1976	.38 (.09)	.86 (.24)
1977	.41 (.11)	.85 (.26)
1978	.25 (.05)	.98 (.21)
1979	.33 (.06)	1.24 (.30)
1980	.39 (.08)	1.07 (.21)
1981	.31 (.08)	1.22 (.35)
1982	.23 (.06)	1.06 (.29)
1983	.07 (.02)	.77 (.52)
1984	.20 (.05)	1.22 (.43)
1985	.13 (.03)	.36 (.11)
1986	.20 (.06)	.33 (.09)
1987	.19 (.04)	.40 (.16)
1988	.25 (.08)	.75 (.41)
1989	.33 (.07)	.84 (.26)
1990	.21 (.05)	.42 (.11)
1991	.31 (.07)	.57 (.14)
1992	.25 (.07)	1.04 (.39)
1993	.18 (.05)	.85 (.26)
1994	.15 (.03)	.50 (.13)
1995	.14 (.03)	.48 (.15)

Table 11b. Summer and fall survey results for 4VWX halibut.

Year	Mean Number/Tow (Standard Error)	Mean Weight/Tow (kg) (Standard Error)
Halibut Spring Survey 4VW 1986-1995		
1986	.25 (.09)	1.08 (.37)
1987	.37 (.11)	2.25 (1.35)
1988	.63 (.24)	2.76 (1.28)
1989	.37 (.13)	1.40 (.53)
1990	.23 (.05)	2.09 (1.02)
1991	.61 (.19)	2.24 (.83)
1992	.31 (.14)	.88 (.43)
1993	.30 (.07)	1.31 (.58)
1994	.20 (.06)	1.07 (.74)
1995	.16 (.04)	.71 (.43)
Spring 4VWX 1979-1984		
1979	1.04 (.16)	3.64 (.76)
1980	.37 (.07)	2.07 (1.03)
1981	.62 (.10)	2.77 (.60)
1982	.48 (.08)	2.06 (.48)
1983	.44 (.08)	2.35 (.53)
1984	.26 (.07)	1.32 (.51)
Fall 4VWX 1979-1984		
1979	.30 (.04)	.79 (.11)
1980	.41 (.09)	1.76 (.50)
1981	.22 (.04)	.92 (.22)
1982	.31 (.06)	1.75 (.38)
1983	.09 (.03)	.33 (.13)
1984	.10 (.04)	.54 (.29)

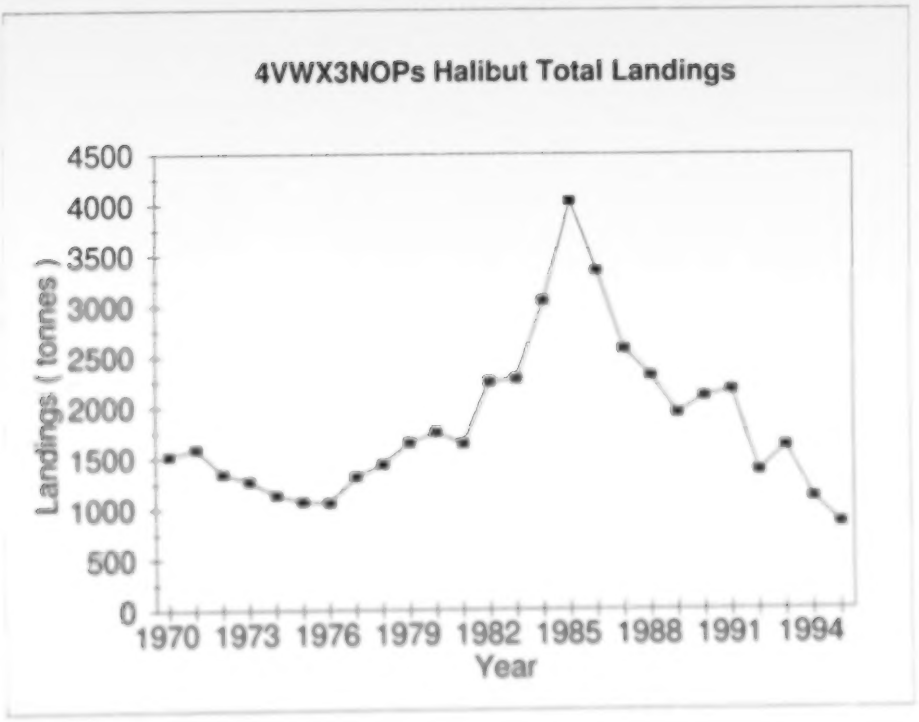

4VWX3NOPs Halibut Total Landings
Landings (tonnes)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1970 1973 1976 1979 1982 1985 1988 1991 1994
Year

Fig. 1a

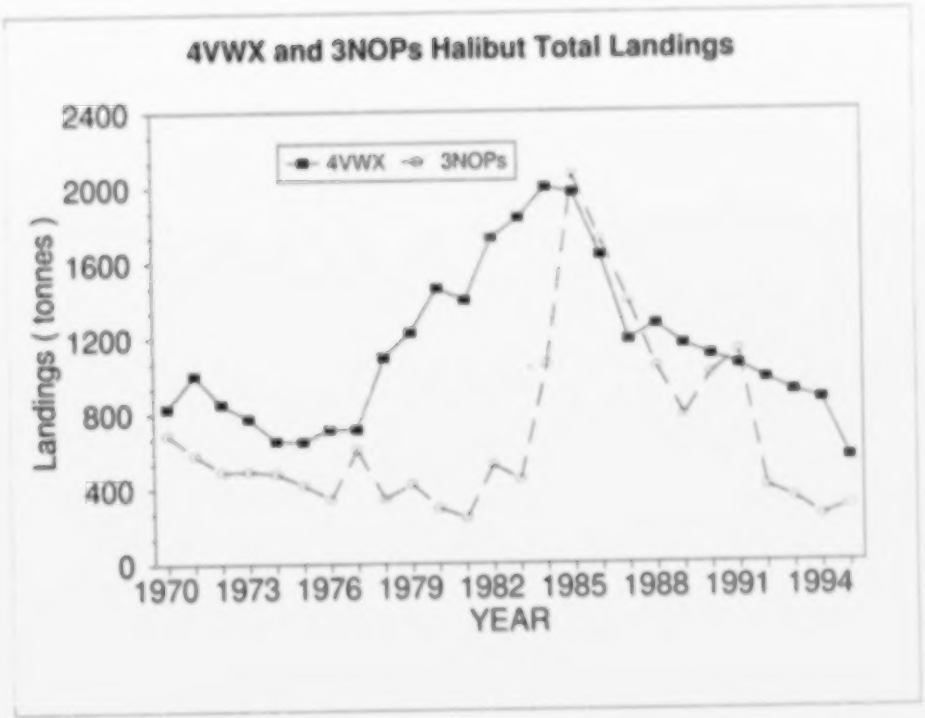

4VWX and 3NOPs Halibut Total Landings
4VWX
3NOPs
Landings (tonnes)
2400
2000
1600
1200
800
400
0
1970 1973 1976 1979 1982 1985 1988 1991 1994
YEAR

Fig. 1b

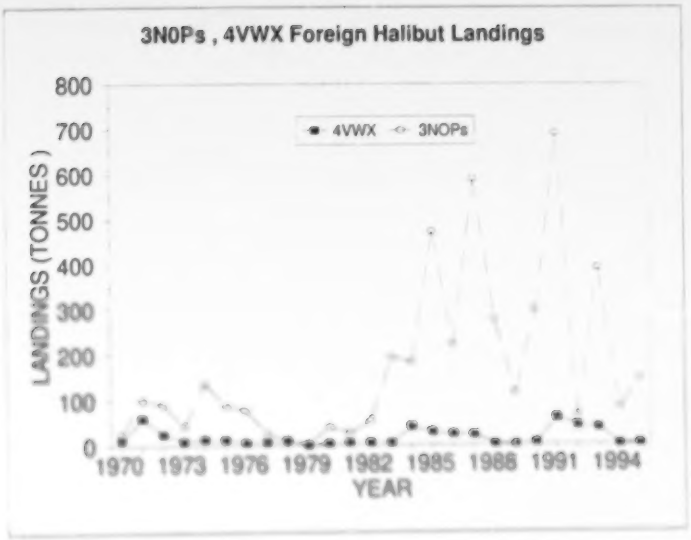


Fig. 2a.

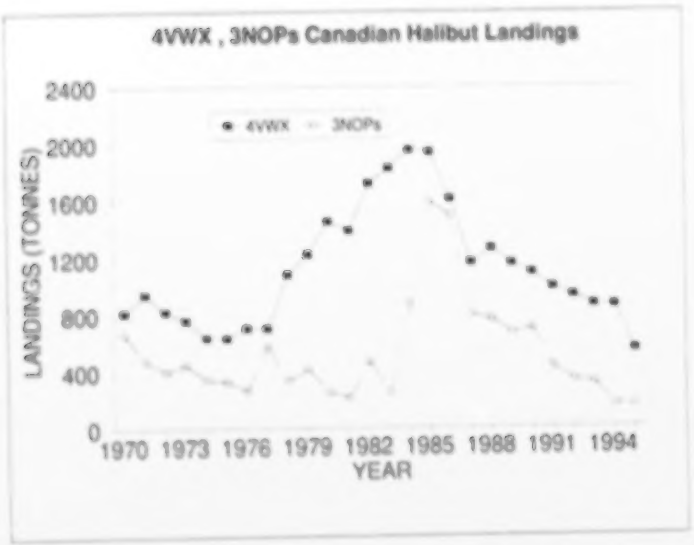


Fig. 2b.

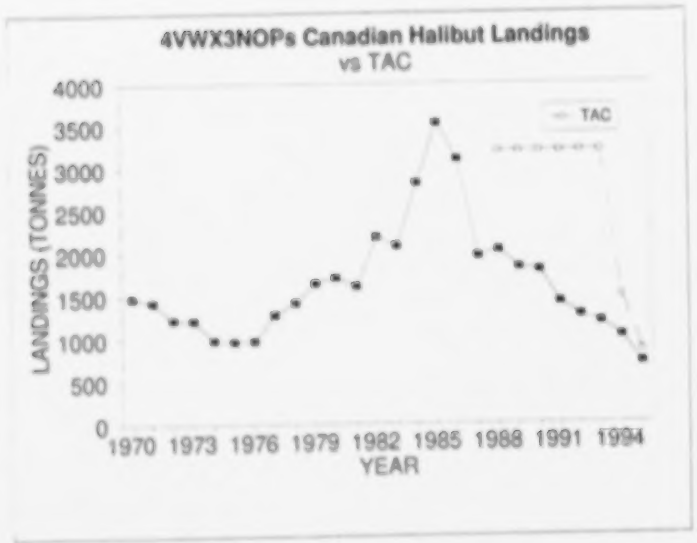


Fig. 2c.

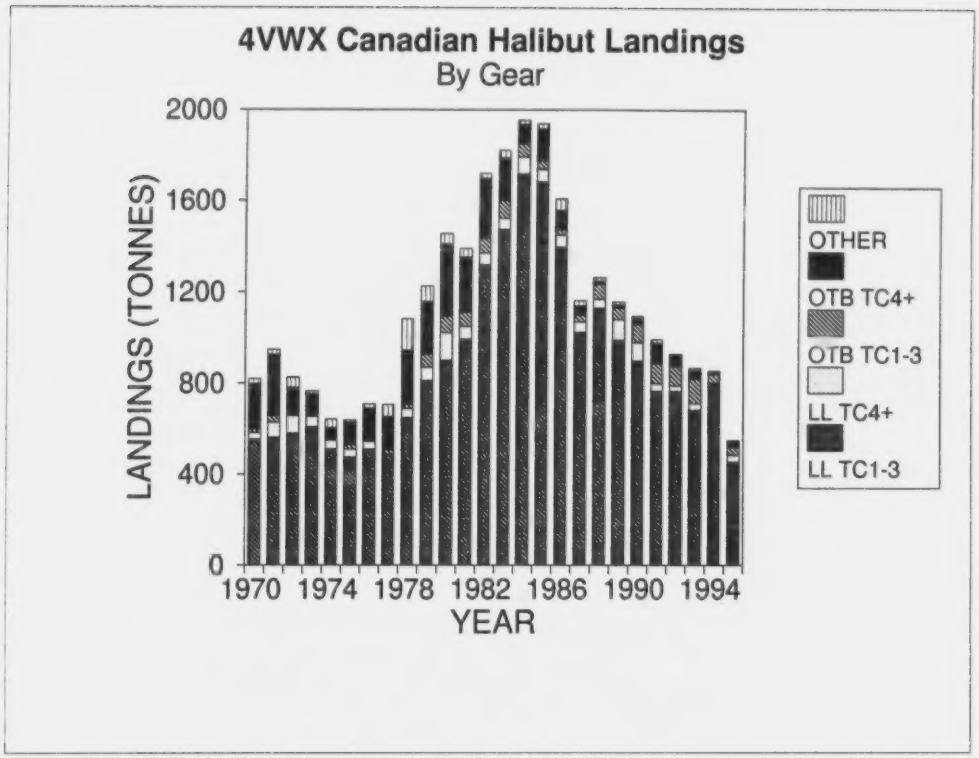

4VWX Canadian Halibut Landings
By Gear
LANDINGS (TONNES)
2000
1600
1200
800
400
0
1970 1974 1978 1982 1986 1990 1994
YEAR
OTHER
OTB TC4+
OTB TC1-3
LL TC4+
LL TC1-3

Fig. 3a.

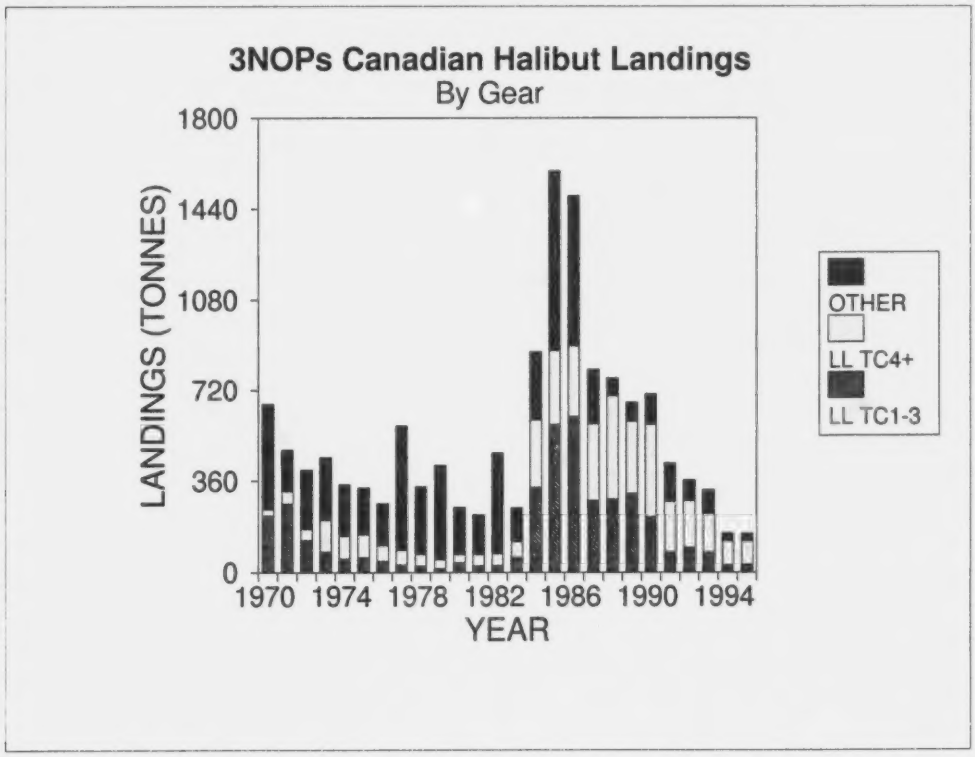

3NOPs Canadian Halibut Landings
By Gear
LANDINGS (TONNES)
1800
1440
1080
720
360
0
1970 1974 1978 1982 1986 1990 1994
YEAR
OTHER
LL TC4+
LL TC1-3

Fig. 3b.

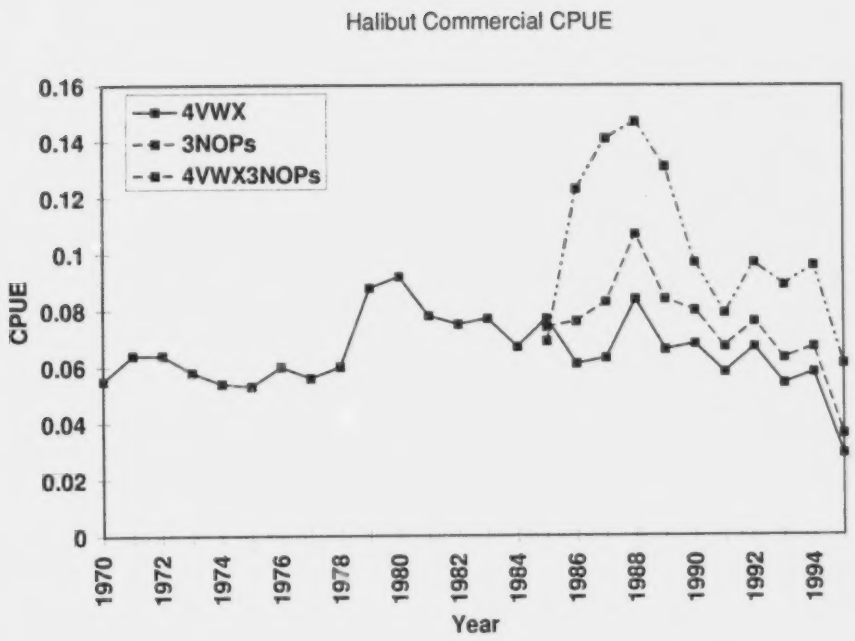

Halibut Commercial CPUE
4VWX
3NOPs
4VWX3NOPs
CPUE
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
Year

Fig. 4a.

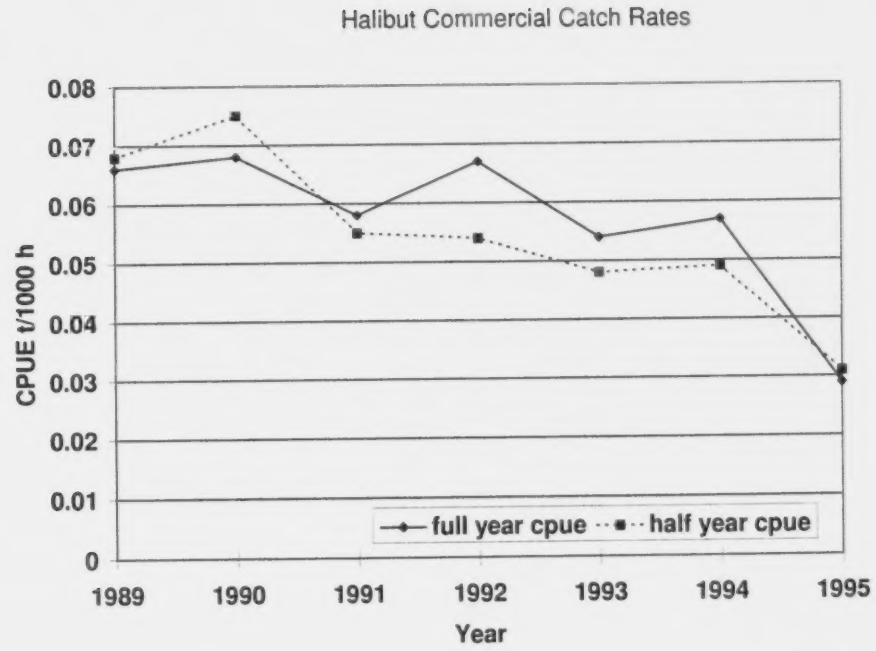

Halibut Commercial Catch Rates
CPUE t/1000 h
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
full year cpue
half year cpue
1989
1990
1991
1992
1993
1994
1995
Year

Fig. 4b.

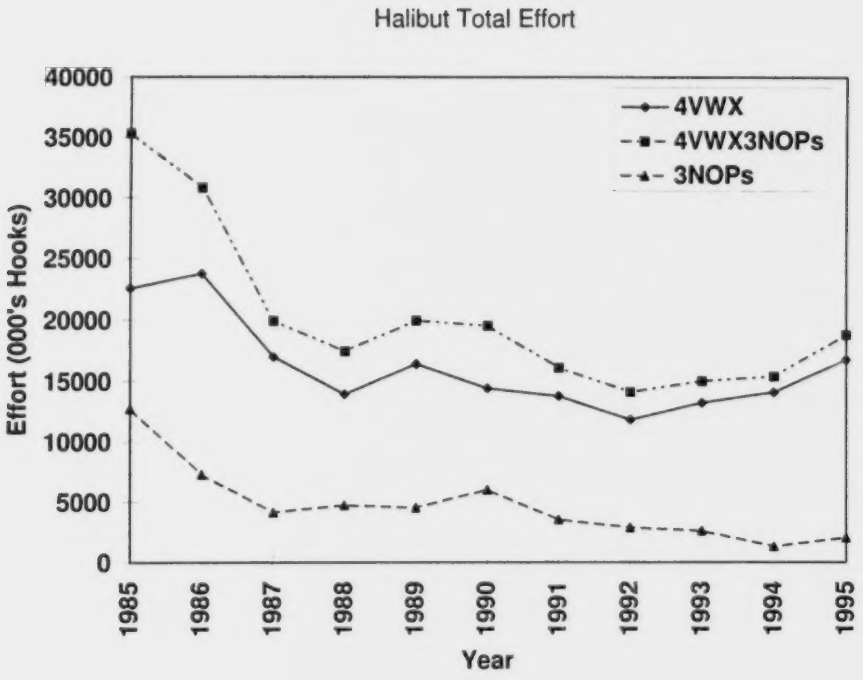

Halibut Total Effort
Effort (000's Hooks)
40000
35000
30000
25000
20000
15000
10000
5000
0
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
Year
4VWX
4VWX3NOPs
3NOPs

Fig. 4c.

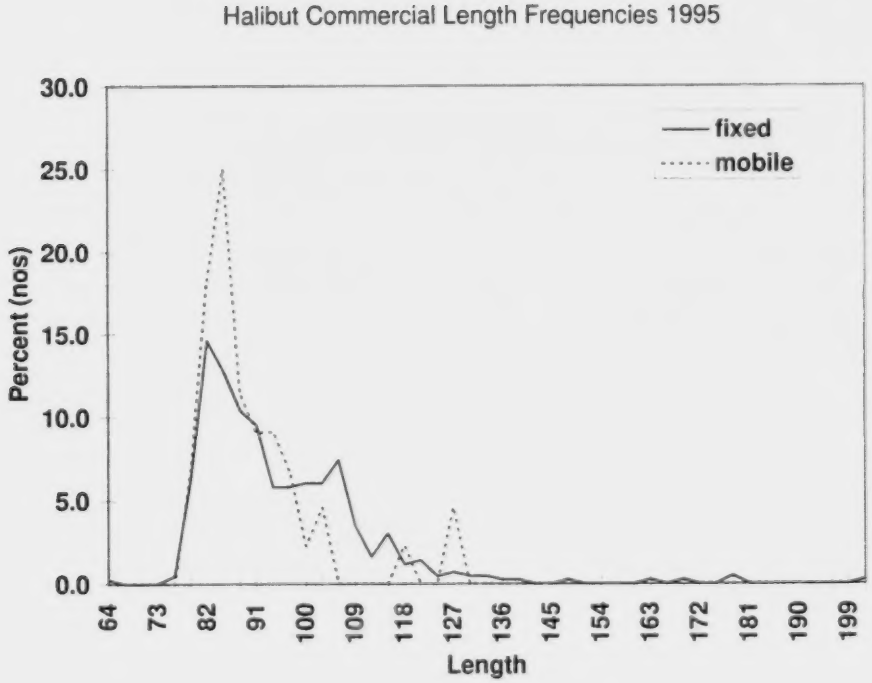

Halibut Commercial Length Frequencies 1995
Percent (nos)
30.0
25.0
20.0
15.0
10.0
5.0
0.0
64
73
82
91
100
109
118
127
136
145
154
163
172
181
190
199
Length
fixed
mobile

Fig. 5.

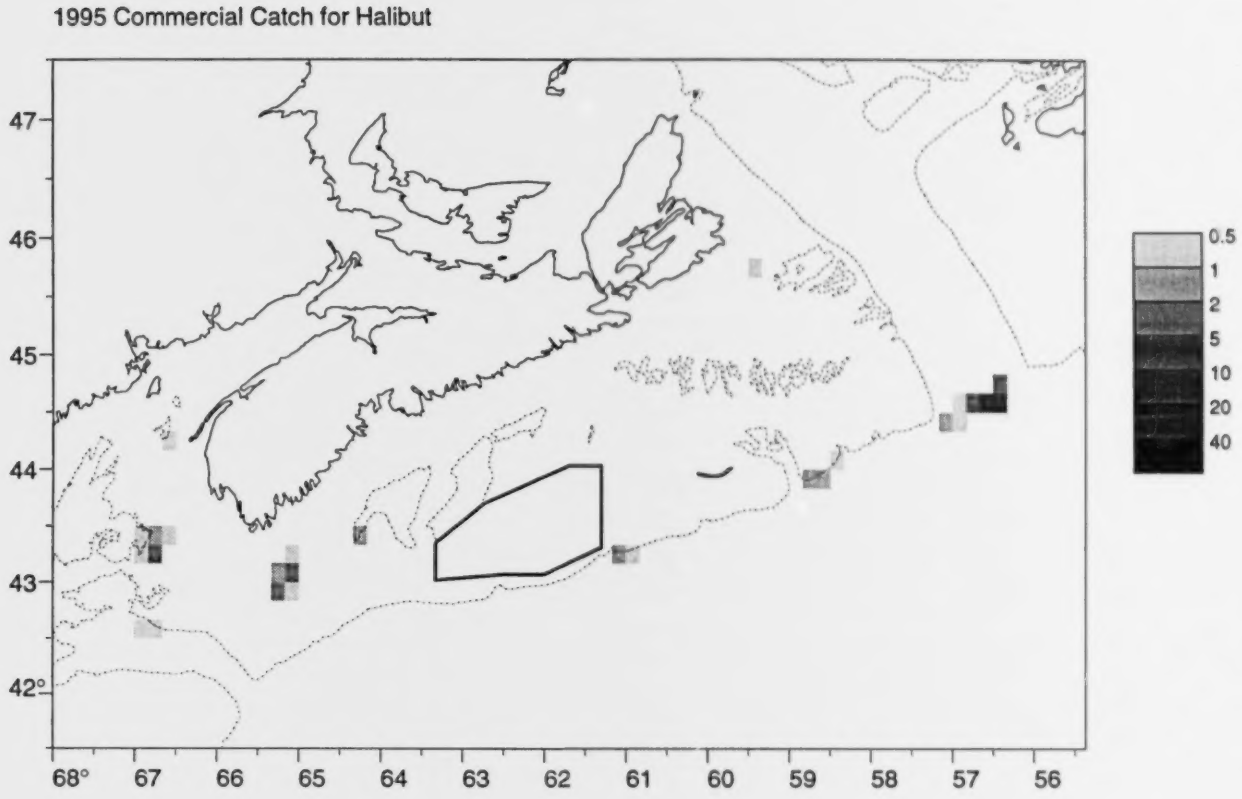
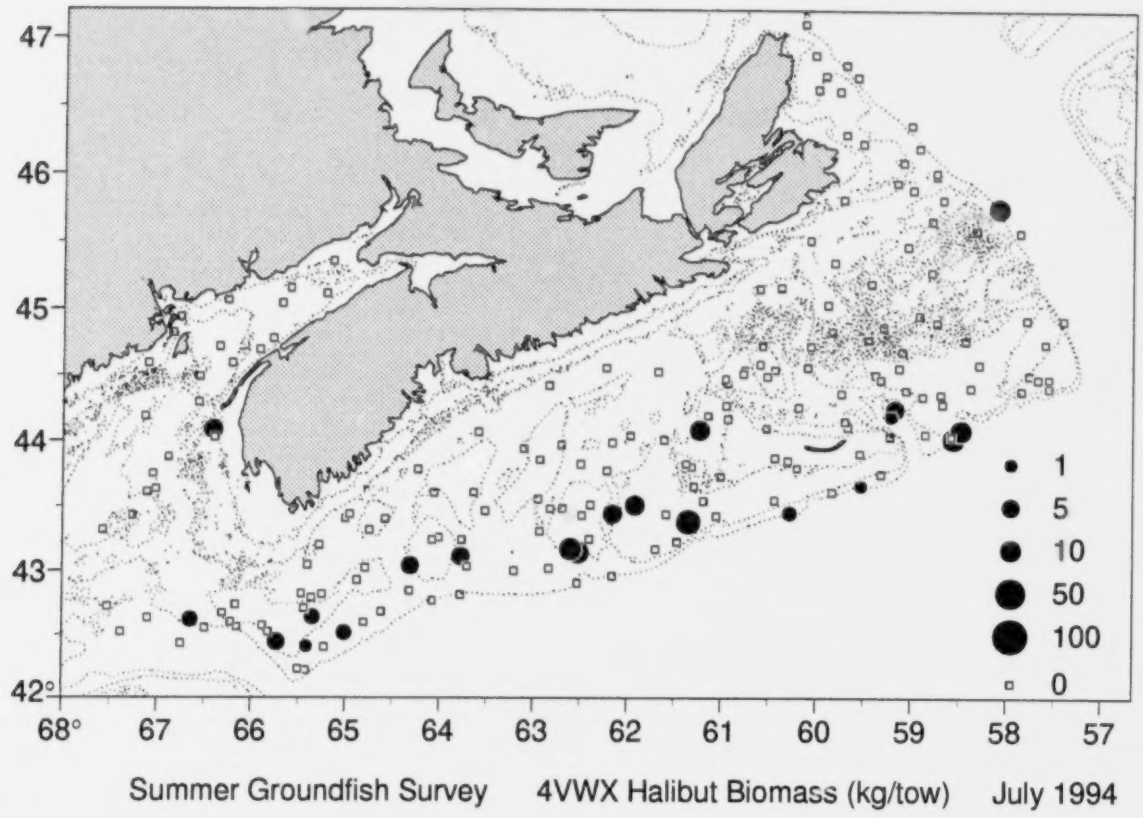

1995 Commercial Catch for Halibut
47
46
45
44
43
42°
68°
67
66
65
64
63
62
61
60
59
58
57
56
0.5
1
2
5
10
20
40

Fig. 6.


47
46
45
44
43
42°
68°
67
66
65
64
63
62
61
60
59
58
57
1
5
10
50
100
0
Summer Groundfish Survey
4VWX Halibut Biomass (kg/tow)
July 1994

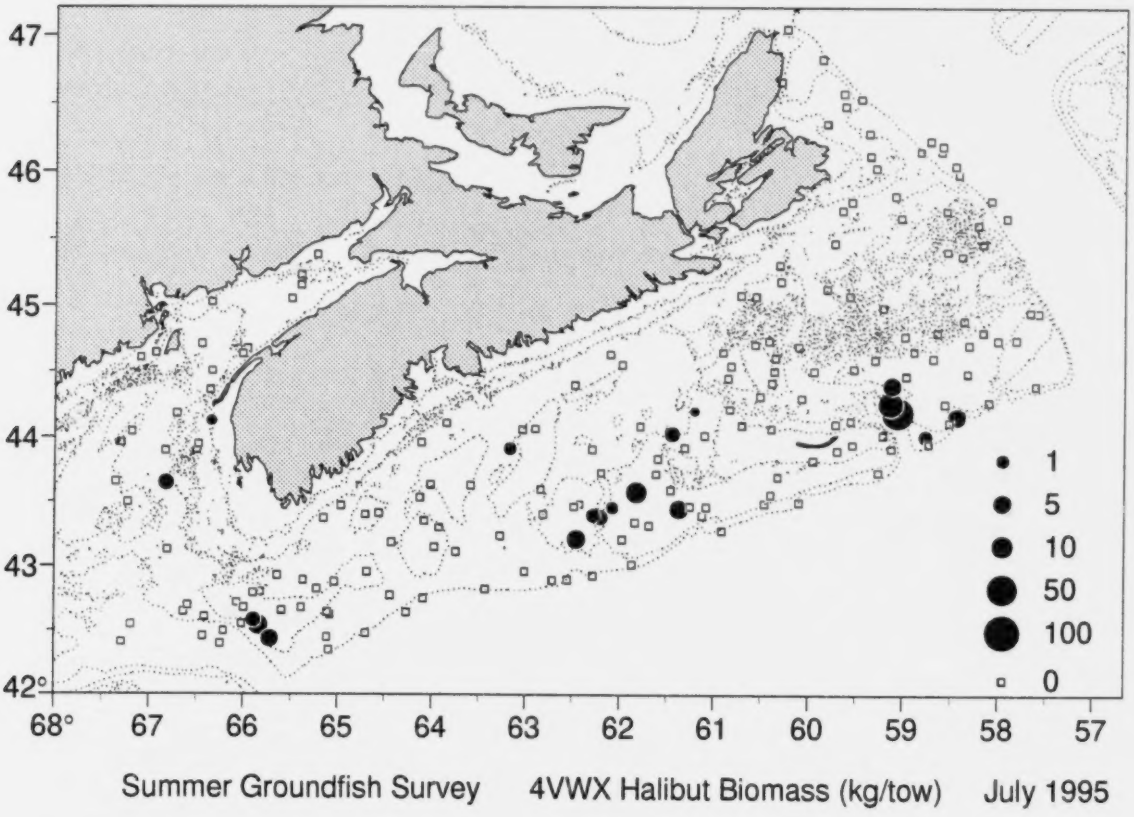

47
46
45
44
43
42°
68°
67
66
65
64
63
62
61
60
59
58
57
1
5
10
50
100
0
Summer Groundfish Survey
4VWX Halibut Biomass (kg/tow)
July 1995

Fig. 7.

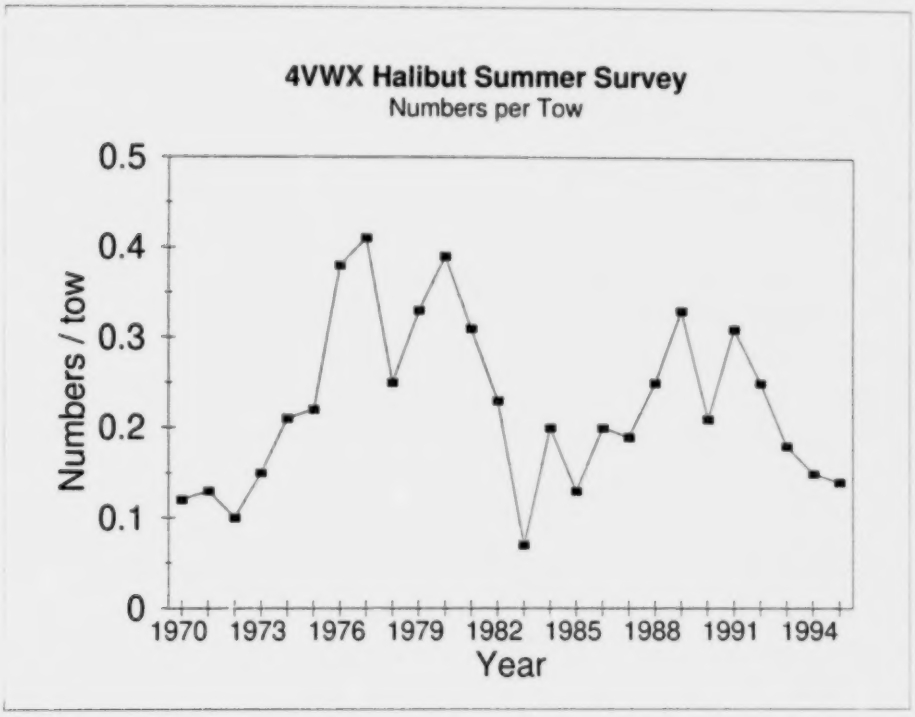

4VWX Halibut Summer Survey
Numbers per Tow
Numbers / tow
0.5
0.4
0.3
0.2
0.1
0
1970 1973 1976 1979 1982 1985 1988 1991 1994
Year

Fig. 8a.

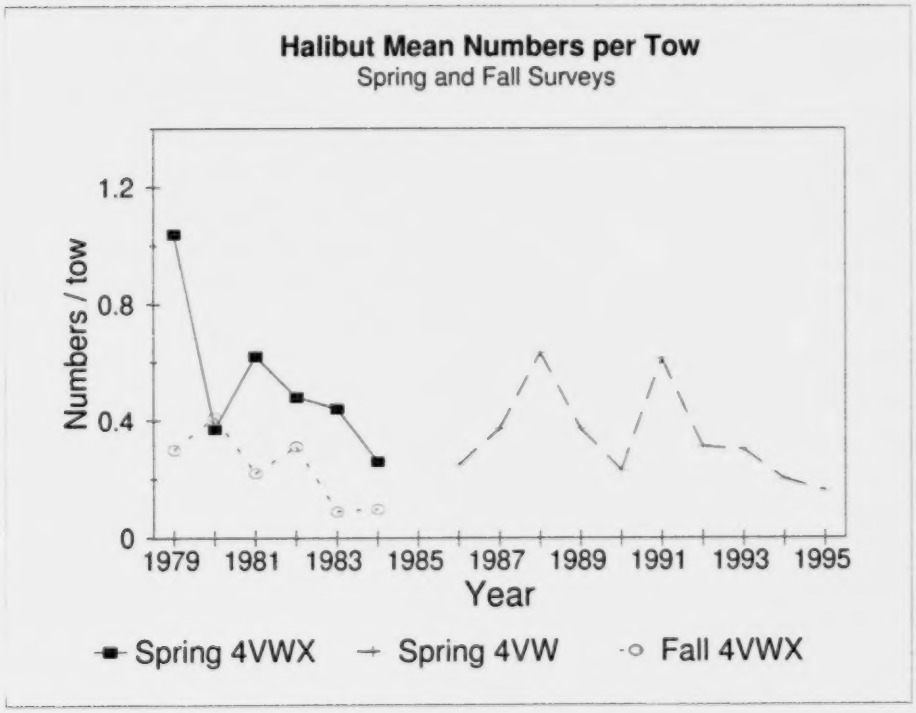

Halibut Mean Numbers per Tow
Spring and Fall Surveys
Numbers / tow
1.2
0.8
0.4
0
1979 1981 1983 1985 1987 1989 1991 1993 1995
Year
Spring 4VWX
Spring 4VW
Fall 4VWX

Fig. 8b.

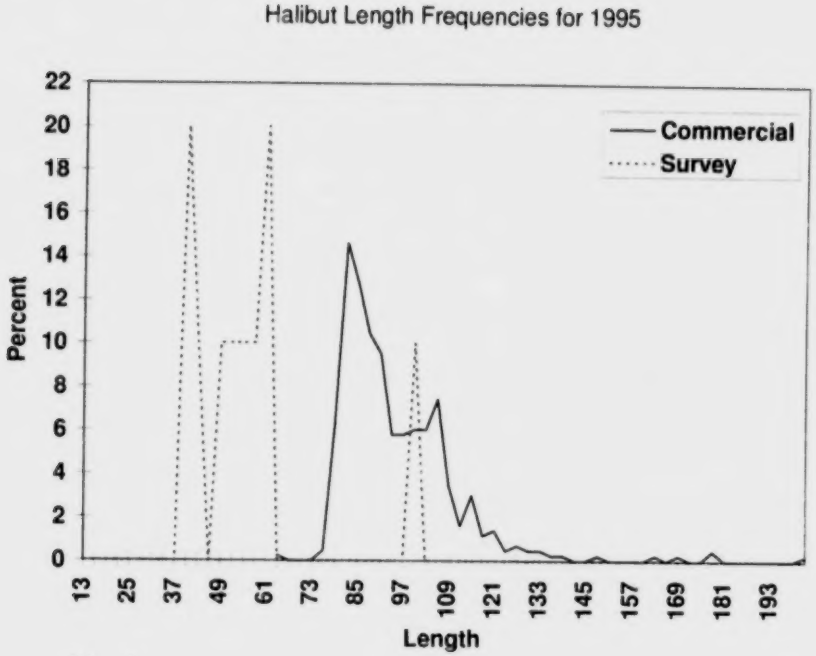

Halibut Length Frequencies for 1995
Commercial
Survey
Percent
Length
0
2
4
6
8
10
12
14
16
18
20
22
13
25
37
49
61
73
85
97
109
121
133
145
157
169
181
193

Fig. 9a.

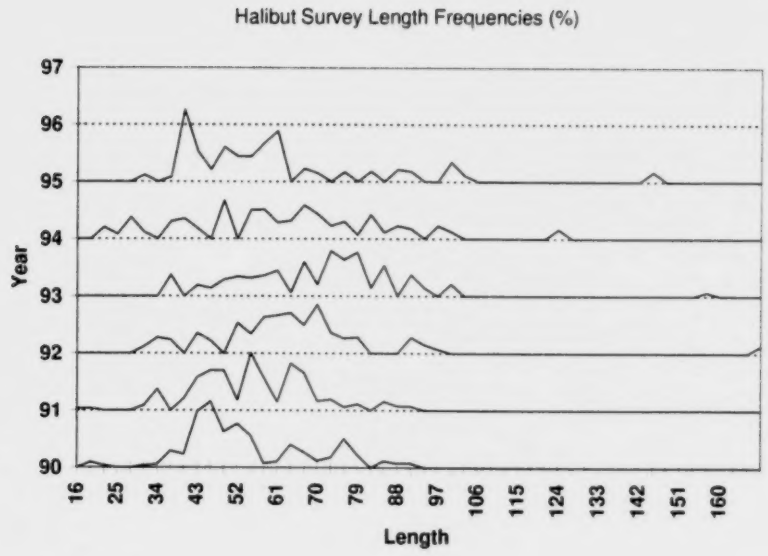

Halibut Survey Length Frequencies (%)
Year
Length
90
91
92
93
94
95
96
97
16
25
34
43
52
61
70
79
88
97
106
115
124
133
142
151
160

Fig. 9b.